Part VIII of MST Curriculum: Performance States

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There is a significant relationship between an athlete's arousal level and their optimal performance (Weinberg & Gould, 2015). The relationship between arousal level and performance is explained by a variety of theories, including the inverted U-hypothesis model (Weinberg & Gould, 2015). For instance, the inverted U-hypothesis states that as arousal level increases, performance increases up to a certain point (Burton & Raedeke, 2008). This point is defined as an individual's zone of optimal functioning (IZOF), where an individual can experience flow, and beyond that point an athlete's performance suffers, often leading to the phenomenon of choking (Burton & Raedeke, 2008). There are various factors that can influence an athlete's ability to achieve their IZOF (Weinberg & Gould, 2015). Understanding the significant relationship between an athlete's arousal level and their performance can optimize an athlete's ability to establish the appropriate techniques to support them in achieving their IZOF, allowing them to achieve the flow mindset and performance excellence, and, in turn, mitigating choking in performance (Williams & Krane, 2015; Weinberg & Gould, 2015; Burton & Raedeke, 2008).

Arousal is defined as a combination of both psychological and physiological intensity within a person at any given moment (Weinberg & Gould, 2015; Lodato, n.d.). Arousal can be illustrated on a spectrum from comatose to frenzied (Weinberg & Gould, 2015; Lodato, n.d.). Individuals with elevated arousal levels are both physically (i.e., elevated heart rate, respiration) and mentally activated (i.e., focused) (Weinberg & Gould, 2015). Anxiety is a state of elevated arousal well beyond an individual's IZOF, typically caused by perceived pressure or stress within the environment (Weinberg & Gould, 2015).

Anxiety is categorized as cognitive anxiety (i.e., negative thoughts or worries), somatic anxiety (i.e., elevated heart rate, increased respiration, sweating) or perceived control state anxiety (i.e., the degree to which an individual feels that they have the resources to handle the performance environment) (Weinberg & Gould, 2015). In addition to cognitive, somatic, and perceived control state anxiety, anxiety can be distinguished as either state anxiety, which refers to an individuals' temporary perception of their experience, or trait anxiety, which refers to an individual's predisposition to experience anxiety in a variety of settings whether or not the environment warrants a threat appraisal (Weinberg & Gould, 2015). Athletes can use a variety of tools to measure their anxiety, such as the Sport Anxiety Scale or Self-report scales (Weinberg & Gould, 2015).

Understanding an athlete's experience of either trait or state anxiety can help coaches and consultants approach the athletes with the appropriate methods to optimally support them (Weinberg & Gould, 2015). For instance, athletes who have trait anxiety may benefit from learning various coping strategies (e.g., instructional positive self-talk or diaphragmatic breathing) through simulations prior to a performance to diminish the level of anxiety that they will experience in similar environments, through the process of acclimatization (Weinberg & Gould, 2015). In contrast, an athlete with state anxiety can still benefit from simulations but can also apply various relaxation techniques (e.g., diaphragmatic breathing) as a part of their pre-performance routines as they prepare for their performance to achieve their optimal arousal level and mitigate any associated anxiety (Weinberg & Gould, 2015).

An athlete's specific emotional state during performance, such as depression (e.g., after a mistake) or elation (e.g., after a successful performance), has various psychological and

physiological components that can further influence performance (Weinberg & Gould, 2015). In addition, athletes can experience stress in their performance (Weinberg & Gould, 2015). Stress, when experienced during performance, is defined as an individual's perception of both the performance demands and their capability to handle the demands, which is especially significant when the associated consequences of failing to meet the demands are substantial (Weinberg & Gould, 2015; Burton & Raedeke, 2008). Stress has a profound impact on an athlete's performance, as it impedes their ability to perform optimally, even on tasks that they have mastered; interferes with their ability to experience the flow mindset and achieve performance excellence; causes interpersonal conflict; destroys teamwork; increases physical injury; and can lead to burnout (Burton & Raedeke, 2008).

Further, stress is often misunderstood, such that certain situations are described as being inherently stressful, such as tournaments or championship games (Burton & Raedeke, 2008). However, athletes can develop the skills to cope effectively with these "inherently stressful" demands, as well as interpret any physiological responses to stress as facilitative to support their performance, and, in turn, mitigate suffering the harrowing consequences of stress (Burton & Raedeke, 2008).

Stress is composed of four stages (Weinberg & Gould, 2015; Burton & Raedeke, 2008). Stage 1: Environmental demand, refers to an individual experiencing some form of a demand from someone or something (e.g., a coach telling an athlete to meet some expectation with a new skill that they developed) (Weinberg & Gould, 2015).

Stage 2: Perception of the demand, refers to how an athlete perceives the demand, considering that everyone has their own perception of a given experience (Weinberg & Gould,

2015). For instance, one individual who has mental resilience might perceive the demand as attainable or a challenge to overcome, whereas another individual who has trait anxiety may perceive the demand as a threat to their competence (Weinberg & Gould, 2015). Additionally, an athlete's sense of personal control influences their perception of the demands and their response to the demands (Burton & Raedeke, 2008). Further, an athlete's sense of personal control is contingent on their perception of the demands as being surmountable based on their current performance capabilities (e.g., skills and strategies) (Burton & Raedeke, 2008).

Stage 3: Stress Response, refers to how the individual responds to their perception of the demand (Weinberg & Gould, 2015). For example, an individual who has mental resilience will maintain composure, appraise the performance demand as a challenge (i.e., challenge appraisal), and rise to the challenge, as they view it as an occasion to prove their competence and they are not deterred by the experience (Weinberg & Gould, 2015; Burton & Raedeke, 2008). Further, an individual with mental resilience has coping strategies that help them to manage the stress effectively, including problem management strategies (e.g., in-performance routines), as well as emotion management strategies, such as increasing positive emotions (e.g., excitement) and appraising other emotions as facilitative as opposed to debilitative (e.g., using anger to energize their performance, as opposed to coursing through the negative thoughts of anger about an opponent) (Burton & Raedeke, 2008). In contrast, an individual who lacks mental resilience and is high in trait anxiety will experience a heightened physiological activation, appraise the demand as a threat (i.e., threat appraisal), which interferes with their concentration, increases muscle tension, causing them more anxiety and their performance suffers (Weinberg & Gould, 2015; Burton & Raedeke, 2008).

Stage 4: Behavioral Consequences, refers to the consequences that the individual experiences as a result of their perceptions and chosen response to the given demand (Weinberg & Gould, 2015). For instance, if the individual perceives the demand as attainable and maintains composure, they will perform effectively and have a successful performance outcome (Weinberg & Gould, 2015). In contrast, if the individual perceives the demand as unattainable and a threat to their competence, they will experience an excessive elevated arousal level (i.e., anxiety), their performance will suffer and reinforce their negative perceptions (e.g., cognitive state anxiety), creating a self-fulfilling prophecy going forward, especially for any associated demands (Weinberg & Gould, 2015).

There are innumerable potential causes of stress that can impact an individual at any given time (e.g., self-doubt about talent, performance demands, expectations in school, job, family, relationships), which can be mitigated by: enhancing an individual's coping strategies for managing emotions (e.g., developing positive appraisals); improving self-confidence (e.g., positive self-talk, positive imagery); developing pre-performance routines to help them to establish their IZOF and "arrive" prepared to perform (i.e., not distracted by other life expectations) (Weinberg & Gould, 2015; Burton & Raedeke, 2008). There are also situational sources of stress, such as event importance and uncertainty (Weinberg & Gould, 2015).

Event importance refers to the value placed on a given event (e.g., a championship game vs. a scrimmage) (Weinberg & Gould, 2015; Burton & Raedeke, 2008). The perceived importance of events should be mitigated by coaches and athletes, such that an athlete places no more importance for one event over another, which allows for athletes to transfer their abilities from practice to performance with minimal disruption to their state of mind (Weinberg & Gould,

2015; Burton & Raedeke, 2008). Uncertainty refers to when individuals focus on the details that they have no control over, such as focusing on when they will play their opponents next or when they might experience an injury that takes them out of the game for good, which can be mitigated by coaches helping athletes to develop routines that help them to refocus on their process when they recognize that they are becoming distracted by uncontrollable variables (Weinberg & Gould, 2015).

There are also personal sources of stress, such as individuals who have trait anxiety and/or low self-esteem (Weinberg & Gould, 2015). Individuals with trait anxiety have predispositions to appraise a significant number of situations as a threat to their well-being, which predisposes them to experience more stress (Weinberg & Gould, 2015). Individuals with low self-esteem are susceptible to experiencing more stress, as they have a low perception of who they are and therefore believe that they lack the internal and external resources to support them in handling different situations and, in turn, perceive more situations as a threat to their well-being (Weinberg & Gould, 2015).

Individuals with trait anxiety can benefit from applying relaxation techniques (e.g., diaphragmatic breathing) that help them to lower their arousal level that is associated with their trait anxiety to diminish the physiological symptoms that interfere with their ability to concentrate in their performance, followed by incorporating positive self-talk to increase their self-confidence (e.g., “I am dedicated to my process!”), and then applying instructional positive self-talk to help them to appraise their arousal level as facilitative (e.g., “my increased heart rate improves my ability to perform, breathe, let’s do this!”) (Weinberg & Gould, 2015; Burton & Raedeke, 2008). Individuals with low self-esteem can benefit from their coaches helping them to

identify their strengths (Biswas-Diener, 2010). “Strengths are our pre-existing capacities that can be drawn out by various situations to make us perform at our best…our strengths are our pre-existing patterns of thought, feelings and behavior that are authentic, energizing, and which lead to our best performance” (Biswas-Diener, 2010, p. 20-21). Coaches can acknowledge the athletes’ strengths in action with positive feedback, to energize them, and serve as motivation to boost their performance, especially during competition (Biswas-Diener, 2010).

Further, increased arousal levels influence an athlete’s performance in a number of ways, including increased muscle tension, fatigue, difficulties with coordination, as well as changes in their attention, concentration, and visual search patterns that can interfere with their ability to coordinate their muscles effectively and concentrate appropriately on the task at hand, which inhibits their ability to perform optimally (Weinberg & Gould, 2015). There are also various symptoms that are associated with stress and anxiety (Weinberg & Gould, 2015). The symptoms that are associated with stress and anxiety include: cold, clammy hands; frequent urinating; excessive sweating; negative self-talk; dazed expression; increased muscle tension; butterflies in the stomach; feeling ill; headache; dry mouth; disrupted sleep; and difficulty concentrating (Weinberg & Gould, 2015). Many of these symptoms are associated with choking (Williams & Krane, 2015; Burton & Raedeke, 2008; Weinberg & Gould, 2015).

As highlighted in Part VI, choking refers to when an individual’s performance progressively deteriorates as their physiological arousal level exceeds their IZOF, causing the individual’s focus to involuntarily narrow and become internally focused, altering their perceptions, causing their muscles to tense, and, ultimately, interfering with their ability to concentrate on the appropriate stimuli in the performance environment (Williams & Krane,

2015; Burton & Raedeke, 2008; Weinberg & Gould, 2015; Mack & Casstevens, 2001). Choking has various antecedents, such as event importance (e.g., focusing on outcome); high expectations (e.g., putting high expectations on themselves); evaluation apprehension (e.g., meeting other's expectations); unfamiliarity (e.g., being in a new environment and unsure what to expect); overload (e.g., an athlete feeling overwhelmed by the attentional demands of the environment) (Weinberg & Gould, 2015).

The mechanisms of choking include: Distractions (e.g., performance environment, audience); cognitive anxiety (e.g., negative thinking, worries); somatic anxiety (e.g., physical sensations, such as sweating, racing heart); perceived control (e.g., inability to control themselves); inadequate coping (e.g., lack mental skills training); and self-focus (e.g., focusing on their feelings); all of which inhibit the athlete from focusing on their process to support their performance (Weinberg & Gould, 2015). Choking has the following consequences: athletes experience a significant decrease in performance, they become highly self-critical, all of which decrease self-confidence and their performance suffers (Weinberg & Gould, 2015).

Additionally, athletes who have low self-confidence and associated dysfunctional thinking, low mental resilience (i.e., mental toughness), and a lack of balanced-sport life (i.e., unhealthy athletic identity) are susceptible to choking as they lack the perspective of their strengths to support them and they define themselves solely on the basis of their sport, particularly on their ability to win or outperform others (Weinberg & Gould, 2015). Further, athletes who are highly self-aware of themselves in crowd settings are susceptible to choking as they can become highly concerned with how they are being perceived by the audience (Weinberg & Gould, 2015). Athletes under stress turn their focus internally as they become self-conscious

and experience all of the accompanying emotions and thoughts that are associated with choking (e.g., fear, doubts, anger) instead of staying externally task-focused on the task at hand (Mack & Casstevens, 2001; Weinberg & Gould, 2015).

Understanding stress, anxiety, and choking, as well as the various sources of the preceding, can help coaches, consultants, and athletes to properly address and establish resources to optimally support athletes in their performance, ultimately mitigating the detrimental impacts of stress, anxiety, and choking on performance (Weinberg & Gould, 2015). There are a variety of theories and models that attempt to explain the relationship between arousal level and performance including, Distraction Theories, Self-Focus Theories, Drive Theory, Social Facilitation Theory, Inverted U-Hypothesis model, Individual Zone of Optimal Functioning Model, Multidimensional Anxiety Theory, The Catastrophe Model, and the Reversal Theory (Weinberg & Gould, 2015).

Distraction theories contend that individuals under pressure are unable to focus their attention on task-relevant stimuli, as their focus becomes distributed to other (e.g., the audience and threat-related) stimuli, as their arousal level increases (Gropel & Mesagno, 2019; Hardy et al., 2001; Mullen et al., 2005). Self-focus theories contend that when athletes experience pressure their attentional focus becomes internally focused (e.g., excessive monitoring of well-established skills) (Gropel & Mesagno, 2019). While these two theories, provide valuable insight into the relationship between pressures and performance, the self-focus theories are more widely accepted in their explanation for motor skill failure and the phenomenon of choking (Mesagno & Mullane- Grant, 2010).

Drive Theory defines the relationship between arousal level and performance as direct and linear (Weinberg & Gould, 2015). Drive Theory poses that the more an athlete's arousal level increases the more their performance improves (Weinberg & Gould, 2015). However, there is minimal ground that this theory stands, as there is clear evidence that an individuals' arousal levels can reach levels of arousal (i.e., anxiety) that interfere with their ability to perform optimally, causing their performance to suffer (Weinberg & Gould, 2015).

Social Facilitation Theory explains that an audience can elevate an athlete's arousal level to support their performance when they perform tasks through automatic processing, which are otherwise automatic skills that need minimal attention to be performed optimally (i.e., attention can be distributed to the performance environment, including the audience, with minimal consequence to their performance) (Weinberg & Gould, 2015). However, an audience can hinder an athlete's performance, if the athlete is asked to perform in front of an audience on tasks through conscious processing, which are not yet established in the athlete's skillset and require conscious effort and demand more attention to be performed optimally (i.e., attention cannot be distributed to the performance environment, such as the audience, otherwise performance will suffer) (Weinberg & Gould, 2015).

According to Social Facilitation Theory, athletes can benefit from not having an audience present while they are initially developing their skills, as this hinders their performance, decreases their self-efficacy, confidence, and increases their anxiety, ultimately causing their performance to suffer (Weinberg & Gould, 2015). While the preceding is true, even well-established athletes' can have their performance decline in the presence of an audience, through the phenomena of choking, which is associated with an athlete's inability to perform optimally

on tasks that would otherwise be effortless for them in their usual performance that results in a continuous decline in their performance (Beckmann, et al., 2013; Weinberg & Gould, 2015; Williams & Krane, 2015).

Due to the fallacies present in the Drive Theory and the Social Facilitation Theory to accurately illustrate the relationship between arousal level and performance to provide coaches, athletes, and consultants the opportunity to optimize these concepts, many professionals turned to the Inverted U-Hypothesis model (Weinberg & Gould, 2015). Physiological arousal level and performance are illustrated with the inverted U-hypothesis model, such that as arousal level increases performance increases up to a certain point (Burton & Raedeke, 2008). The point where arousal level and performance are at optimal levels is referred to as an individual's zone of optimal functioning (IZOF), where an individual can experience flow (Burton & Raedeke, 2008). Further, in the instance that the individual's arousal level exceeds that optimal level the individuals' performance will decrease as they become distracted by the somatic (e.g., physical) and cognitive (e.g., negative thoughts) anxiety (i.e., as their mind is redirected to threat related stimuli), ultimately making the athlete susceptible to choking (Burton & Raedeke, 2008; Mesagno & Marchant, 2013).

The inverted U-hypothesis model is broadly accepted for its accuracy for depicting the relationship between arousal level and performance (Weinberg & Gould, 2015). For instance, many individuals can relate to the experience of low arousal levels and their inability to perform and concentrate optimally, as well as the experience of being over their optimal arousal level and the tendency for their performance to suffer, which contends that there is an optimal arousal level that an individual can reach somewhere in between to perform optimally (Weinberg & Gould,

2015). In addition to the inverted U-hypothesis model, the Individualized Zones of Optimal Functioning (IZOF) model founded by Hanin, a Russian sport psychologist, illustrates an accurate picture of the relationship between arousal level and optimal performance (Weinberg & Gould, 2015).

The IZOF model explains that every individual has their ideal arousal level that is associated with their optimal performance, such that anywhere outside of this zone an individual's performance will suffer (Weinberg & Gould, 2015). The IZOF model differs from the inverted-U hypothesis model in two distinct ways (Weinberg & Gould, 2015). For one, an individual's arousal level does not always fall on the midpoint of the spectrum, as it does for the inverted U-hypothesis model (Weinberg & Gould, 2015). For instance, some athletes operate best with a lower arousal level for a given activity, while another athlete needs a far greater arousal level to perform that same activity (Weinberg & Gould, 2015). Second, the optimal arousal level is more accurately a bandwidth on the arousal spectrum and not a specific point (Weinberg & Gould, 2015).

According to the IZOF model, athletes need to identify their IZOF, such as through the process of imagery (i.e., recalling past performance highlights to determine the associated thoughts, emotions, and arousal level), to determine the types of emotions, thoughts, and behaviors that they can engage to establish their optimal arousal level to support future performances (Weinberg & Gould, 2015). The IZOF states that there are both positive (e.g., calm, confident, and excited) and negative (e.g., fearful, anger, annoyed) emotions that have the potential to support or hinder performance depending on the performance demands and the IZOF for the individual (Weinberg & Gould, 2015; Williams & Krane, 2015).

The Multidimensional Anxiety Theory (MAT) explains that cognitive and somatic state anxiety have the potential to affect an individual's performance in different ways (Weinberg & Gould, 2015). According to the MAT, cognitive state anxiety (e.g., doubts and worries) is associated with negative performances, whereas somatic state anxiety (e.g., physiological manifestations, such as increased heart rate and respiration) is associated with the inverted U-Hypothesis model and the IZOF and can result in improved performances up to an optimal level (Weinberg & Gould, 2015). Due to the variations in each individual on their interpretations of anxiety and arousal levels, MAT has little support to predict performance outcomes for athletes and, in turn, is rarely used to establish programs to attempt to support performance (Weinberg & Gould, 2015).

The Catastrophe model (CM), a phenomenon established by Hardy, attempts to explain the relationship between arousal and performance by posing that performance is contingent on the interaction between arousal and cognitive anxiety (Weinberg & Gould, 2015). The CM explains that an increased physiological arousal level supports performance progressively up to an optimal point, much like the inverted U-hypothesis model, only in the absence of any cognitive state anxiety (e.g., negative thoughts, doubts, worries) (Weinberg & Gould, 2015). In other words, if cognitive state anxiety is present, as an athlete's arousal level continues to elevate, they will reach a tolerance threshold where their performance will hit a peak and then rapidly decline (i.e., illustrating the catastrophe) (Weinberg & Gould, 2015). After the athlete experiences the performance catastrophe their performance will continue to suffer, as they have now created a cyclical, self-fulfilling prophecy of catastrophes from their cognitive state anxiety (e.g., doubts and worries), that continues to decrease their self-efficacy and self-confidence that will result in proceeding performance catastrophes (Weinberg & Gould, 2015).

According to the CM, in order for athletes to regain control of their performance, especially after performance catastrophes, they will need to take the following steps: profoundly lower their physiological arousal level, such as applying relaxation techniques (e.g., diaphragmatic breathing); restructure their thought process, such as using positive self-talk (e.g., "I am confident in my strategies to support me") to eliminate any remaining cognitive state anxiety (e.g., doubts and worries); followed by elevating their arousal level to an optimal level, such as by using motivational positive self-talk and the process of imagery, such as a speaking a mantra repeatedly (e.g., I can do this!") with positive imagery of their ideal performance (Weinberg & Gould, 2015; McCutcheon, 2021). The CM explains that performance only suffers when cognitive state anxiety is elevated beyond optimal levels as their physiological arousal elevates, therefore managing cognitive state anxiety is integral to supporting optimal performance (Weinberg & Gould, 2015).

Reversal Theory (RT) explains that how an individual interprets their arousal level impacts their performance (Weinberg & Gould, 2015). According to RT, an athlete's interpretation of their arousal level significantly impacts their performance, and an athlete can reverse their interpretation of their arousal level from negative or positive at any moment (Weinberg & Gould, 2015). Optimizing an athlete's interpretation of their arousal level to one that helps them to establish their optimal arousal level will improve their performance outcomes (Weinberg & Gould, 2015). For instance, helping athletes to understand that the physiological manifestation of excitement and nervousness (e.g., elevated heart rate, respiration) are identical provides the athlete with the opportunity to give their elevated arousal level a positive appraisal like excitement, mitigating any cognitive anxiety ("I am going to mess up, because I am so

nervous!") associated with a negative appraisal (e.g., nervousness) (Weinberg & Gould, 2015; McCutcheon, 2021).

In addition to the preceding theories, it is important to explain that how an athlete interprets their anxiety (i.e., facilitative or debilitative) can predict their performance outcomes (Weinberg & Gould, 2015). When athletes view their anxiety as facilitative it leads to optimal performance outcomes (Weinberg & Gould, 2015). In contrast, when athletes view their anxiety as debilitative it leads to poor performance outcomes (Weinberg & Gould, 2015). How an athlete interprets their anxiety, as either facilitative or debilitative, is dependent on their mental resilience, specifically their perceived control over the situation as they experience their anxiety, as well as personal and situational variables (Weinberg & Gould, 2015). For instance, if an athlete feels in control of their performance, such that they feel that they have the skills to take on the task, they will view their anxiety as facilitative to help them to take on the task and they ultimately can rise to the occasion and perform optimally (Weinberg & Gould, 2015). In contrast, if the athlete feels out of control of their performance, they are doubting their abilities, such that they feel that they do not have the skills to take on the task, they will view their anxiety as debilitative and overwhelming and will be unable to cope with the pressure and their performance will suffer (Weinberg & Gould, 2015).

The various personal factors that can influence how an individual interprets their anxiety, include trait anxiety, neuroticism, extraversion, achievement orientation, mental resilience, self-confidence, sex, and psychological skills (Weinberg & Gould, 2015). The situational variables include an individual's competitive experience, skill level, expectations, sport, and performance demands (Weinberg & Gould, 2015). For example, elite-athletes who have more competitive

experience, self-confidence, and skill proficiency interpret their anxiety as facilitative, and, in turn, experience anxiety less compared to non-elite athletes with less experience (Weinberg & Gould, 2015).

Understanding how anxiety and, ultimately arousal, is interpreted, including how that impacts athletes in their performance can ensure that coaches and consultants provide the appropriate methods to support facilitative interpretations of arousal to enhance athletes' mental resilience to optimize their performance (Weinberg & Gould, 2015). Athletes can benefit from using a variety of techniques to assist them in viewing their arousal as facilitative (Weinberg & Gould, 2015). For example, a hockey player could use positive self-talk to help them to appraise their elevated arousal levels as facilitative anxiety, and they might say, "my anxiety is just my elevated arousal level that is going to help me take on this opponent. I trust in my skills. I am ready for this performance. My opponent is not going to know what to do with the energy that I have coming for them to get that puck. Let's do this!" (Weinberg & Gould, 2015).

Arousal is multifaceted with both physiological (e.g., elevated heart rate, respiration, muscle tension) and psychological underpinnings (e.g., thoughts and emotions), understanding the optimal combination of each facet can optimize an athlete's ability to perform optimally and achieve performance excellence (Weinberg & Gould, 2015). Athletes should identify the optimal combination of their arousal-related emotions that are associated with their best performances (Weinberg & Gould, 2015). Athletes should reflect on their performances through the process of imagery to enhance their self-awareness to recognize how their performance and arousal levels (i.e., anxiety) are impacted by various personal and situational variables to address each variable appropriately (Weinberg & Gould, 2015).

Athletes mitigate any associated anxiety from elevated arousal levels that are outside of their IZOF by lowering their arousal level to optimal levels and increasing their sense of confidence (Burton & Raedeke, 2008). Anxiety and confidence exist on opposite ends of a spectrum (i.e., anxiety on one end of the spectrum and confidence on the other end of the spectrum) (Williams & Krane, 2015). In other words, if an athlete feels confident, they diminish their ability to experience anxiety (Williams & Krane, 2015). Athletes can use the process of imagery to prepare for overcoming obstacles in their performance, create a positive plan on how to overcome each obstacle, and have their recovery and in performance routines ready to support them if they encounter any unexpected obstacles, which allows the athlete to feel confident and have composure in their performance, ultimately mitigating any anxiety (Orlick, 2016; Burton & Raedeke, 2008).

When an athlete lacks self-confidence (e.g., personal variable), it makes them susceptible to cognitive state anxiety (e.g., doubts, worries, negative thoughts) (Weinberg & Gould, 2015; Williams & Krane, 2015). The athlete can benefit from applying relaxation techniques, such as diaphragmatic breathing to lower their physiological arousal level, followed by incorporating positive imagery of a performance highlight and positive self-talk (e.g., by referencing their strengths list) to remind them of all of their strengths to enhance their sense of competence and, in turn, increase their confidence in their ability to handle the performance demands, helping to mitigate the associated anxiety (Weinberg & Gould, 2015; Williams & Krane, 2015; Biswas-Diener, 2010). Athletes and coaches should pay attention to the signs of increased arousal levels in performance in order to optimize their arousal level with a facilitative appraisal (e.g., “I feel my heart rate racing, I am ready to take on the competition, take a couple deep breaths, focus on my process, right here, right now, let’s do this!”) to mitigate any debilitating consequences on

their performance from any debilitative interpretations of their elevating arousal levels (Weinberg & Gould, 2015).

Athletes should receive individualized practices and training with consideration of their predispositions, personal factors, and the situational variables that influence their arousal level and performance (Weinberg & Gould, 2015). When athletes' predispositions, personal factors and the situational variables are considered athletes, coaches, and consultants can optimize the variables to most efficaciously support the athletes (Weinberg & Gould, 2015). For instance, one athlete may be very confident, thrive under pressure and benefit from the pressures of the performance environment to concentrate and perform their best, and therefore, training in simulations that are similar to the performance environment optimizes their arousal levels to support their optimal performance and primes them for the competition environment (Weinberg & Gould, 2015).

In contrast, another athlete may lack self-confidence (i.e., personal factor) and have trait anxiety (i.e., predisposed to perceive the pressures of training or competition as a threat), and view the anxiety for the upcoming championship game (i.e., situational variable) as debilitating (Weinberg & Gould, 2015). Developing a pre-performance routine for the athlete who lacks self-confidence and has trait anxiety can support their training process to prepare to perform optimally in their championship game (Weinberg & Gould, 2015). For instance, applying relaxation techniques (e.g., diaphragmatic breathing) to achieve the athlete's optimal arousal level, incorporating positive imagery of ideal performances (e.g., to recall how their ideal performances, including recognizing how their increased arousal levels supported them in their performance), applying positive self-talk of their strengths (e.g., "I am dedicated to my

progress!") to increase their self-confidence, and using instructional positive-self talk to help the athlete to interpret any increase in arousal level as facilitative (e.g., "my elevated heart rate increases blood flow to my muscles so I can move efficiently to take on this opponent, breathe, focus, right here, right now, let's do this!") to direct their attention on the aspects of their performance that will optimize their sense of control with their increased arousal level, ultimately benefitting them in their training and their upcoming championship game (Weinberg & Gould, 2015).

The athlete can also benefit from developing and incorporating a recovery routine that helps them to regain control of their performance when their arousal level leaves their IZOF (Weinberg & Gould, 2015). For instance, incorporating relaxation techniques (e.g., diaphragmatic breathing) and instructional positive self-talk (e.g., "my increased heart rate supports my performance, breathe and optimize my energy to take on this tough competition, focus on my process, let's do this, like I do every day!") will help the athlete to refocus on their process, while appraising their arousal level as facilitative to optimize their arousal level to support optimal performance (Weinberg & Gould, 2015).

After the athlete's training and performance, the athlete can benefit from using a post-performance routine to reflect on their arousal level and performance, such as through the process of imagery to vividly recall their experience (i.e., to use the process of imagery most effectively to support their performances going forward and to continue to develop a positive appraisal of their arousal levels to support their performance, including recognizing how their increased arousal level enhanced their focus when they breathed into it and focused on their process) (Weinberg & Gould, 2015). The preceding increases the athlete's self-efficacy and self-

confidence and supports them in mitigating their predisposition to perceive pressures as a threat, allowing them to effectively cope with anxiety and stress, ultimately optimizing their arousal level and enhancing their IZOF (Weinberg & Gould, 2015).

Athletes can use positive self-talk (e.g., referencing their strengths list highlighted in Part III), to provide them with reasons as to why they can feel confident in themselves to perform optimally and, in turn, optimize their composure (Orlick, 2016). Confidence and composure allow athletes to perform optimally (Orlick, 2016). Athletes can use pre-performance routines to help them to establish their ideal arousal level, concentration, and confidence to be mentally prepared for their performance (Orlick, 2016). Athletes then can incorporate their in-performance and recovery routines to mitigate any distractions in their performance, so they can stay committed to their process and perform optimally (Orlick, 2016). Athletes can also enhance their confidence by increasing their sense of competence through effective goal setting, such as achieving various performance and process goals of progressing difficulty, as well as incorporating the process of imagery, such as imagining a performance highlight (Burton & Raedeke, 2008; Orlick, 2016; Weinberg & Gould, 2015).

Coaches can provide autonomy supportive environments to optimize an athlete's IZOF (Weinberg & Gould, 2015). Autonomy-supportive environments allow athletes to exert control over their performance by meeting their basic psychological needs that supports their sense of success and well-being, enhancing their self-confidence, and, in turn, allowing them to face challenges with a resilience to overcome any adversity, ultimately optimizing the athlete's IZOF and mitigating any anxiety and choking (Mageau & Vallerand, 2003; Weinberg & Gould, 2015; Buning & Thompson, 2015; Readdy, et al., 2014).

Coaches can further optimize and athlete's IZOF by encouraging the development of a healthy athletic identity (Mackenzie, 2017; Caroll & Gervais, 2016). When coaches are present and supportive during the process of self-discovery and the development of autonomy, athletes can grow both within their sport and personal lives (Mackenzie, 2017; Caroll & Gervais, 2016). A healthy athletic identity and balance optimizes an athlete's IZOF, as they can maintain a perspective of who they are inside and outside of sport and therefore, are less susceptible to define themselves solely on the outcomes of their performance, and they have an awareness of their resources (e.g., friends, family, goals, and values) to support them, and, in turn, enabling them to function optimally in performance (MacKenzie, 2017; Baum et al., 2014; Krizan & Herlache, 2016; Tempesta, et al., 2018; Lemola, et al.,2013).

In the presence of setbacks, mistakes, and failures, athletes can maintain composure by keeping an optimistic mindset and appraising these experiences as opportunities to establish a better focus (e.g., in-performance routine) (Orlick, 2016). Further, when athletes remain composed, athletes can push their performance to the next level with the new feedback from their previous experiences (Orlick, 2016). Athletes can also optimize any anger that arises by appraising their anger as a burst of energy to fuel their performance (Orlick, 2016). Athletes can also use imagery to immediately view their mistake with a clear lens on what they did in their performance and then re-creating their performance with an ideal performance to address and correct their mistake to stay present in the performance to perform optimally (Orlick, 2016; Weinberg & Gould, 2015; McCutcheon, 2021; Burton & Raedeke, 2008).

Athletes can also optimize the positive mindset by celebrating their successes, big and small, using their strengths regularly, and taking care of their health (i.e., sleeping well, eating

well) (Orlick, 2016; Biswas-Diener, 2010). Athletes can use journals to reflect on their performances, to highlight positive experiences, and to express gratitude for all that they are fortunate to have in their life (Orlick, 2016). The preceding increases an athlete's positive attitude, which increases their sense of confidence and ability to maintain composure in performance (Orlick, 2016).

According to the self-focus theories and based on the understandings of the phenomenon of choking, the process of hemisphere-specific priming has the potential to improve performance and mitigate choking (Hellige, 1993). Hemisphere-specific priming involves imposing concurrent activity, such as through repetitive left-hand contractions, that selectively activates the right-hemisphere, which creates advantages for the performance of an activity that rely on functions of the right-hemisphere (Hellige, 1993). More specifically, electroencephalogram studies reveal that squeezing a soft ball with the left hand enhances right-hemispheric activation, which is associated with the execution of automated behaviors and optimizes the visuospatial processes that are required for optimal performance (Beckmann, et al., 2013; Cross-Villasana, et al., 2015; Harmon-Jones, 2006; Peterson, et al., 2008; Gable, et al., 2013).

Further, enhancing right-hemispheric activation also suppresses left-hemispheric activation, minimizing the potential distractions that are associated with left-hemispheric functions (Beckmann, et al., 2013; Cross-Villasana, et al., 2015; Brasil-Neto, et al., 1993; Zanette, et al., 1998; Baumer, et al., 2002). Verbal-analytic processing and conscious control processing, both of which are associated with choking, are activated in the left-hemisphere (Beckmann, et al., 2013; Crews, 2004; Kerick et al., 2004; Landers et al., 1994; Klimesch, 1998; Klimesch, et al., 2007; Jensen, 2010; Bonato, 1996; Hatfield, et al., 2004; Del Percio, 2009; Milton, et al., 2004). By suppressing left-hemispheric activation, through enhanced right-

hemispheric activation, athletes can prevent choking associated with left-hemispheric dominance (Beckmann, et al., 2013; Crews, 2004; Kerick et al., 2004; Landers et al., 1994; Klimesch, 1998; Klimesch, et al., 2007; Jensen, 2010; Bonato, 1996; Hatfield, et al., 2004; Del Percio, 2009; Milton, et al., 2004). The reduction in cortical activity in the left-hemisphere is attributed to inhibitory mechanisms, that are activated after the repetitive hand contractions, which are designed to prevent neuronal hyper-excitability (e.g., seizures) (Cross-Villasana, et al., 2015).

Left-hand squeezing can easily be integrated into an athlete's pre-performance routine and/or recovery routine to mitigate choking in performance (Beckmann, et al., 2013; Mesagno, Marchant, & Morris, 2008; Mesagno & Mullane-Grant, 2010). Athletes also benefit from the process of acclimatization, where they perform in simulations and have the opportunity to become accustomed to the sensations of physiological arousal that often lead to choking, so they can develop positive appraisals of those experiences to mitigate debilitative anxiety and prevent choking (Cross-Villasana, et al., 2015).

Coaches can also mitigate choking in an athlete's performance by minimizing the involvement of left-hemispheric functions (e.g., verbal-analytic processing) in their skill development through implicit learning (e.g., a golfer being told to create an arch with their club to hit their trajectory) without any explicit instructions (e.g., which involve verbal-analytic processing) (Masters, 2000; Cross-Villasana, et al., 2015). While implicit learning mitigates choking, the process of skill development through implicit learning can take longer, therefore, to accelerate skill learning while minimizing explicit instructions, coaches can use biomechanical metaphors through the process of analogy motor learning to teach complex actions (e.g., hitting a table tennis forehand, as if they are 'drawing a right-angle triangle') (Masters, 2000).

In addition, athletes can benefit from applying a technique called, the Quiet Eye (QE), which involves the athlete defining a final visual fixation point to direct their focus prior to executing their skill (Vickers, 2007). The QE is a form of implicit learning that limits the number of explicit information that can be inadvertently integrated in their process that can serve as potential distractions in the athlete's process when athletes start to experience pressure in the performance environment (Vickers, 2007; Cross-Villasana, et al., 2015).

Every sport is unique in the performance demands that are required for each athlete at any given time and every athlete has their specific IZOF that will optimize their performance in the ever-changing demands of the performance environment (Jackson & Csikszentmihalyi, 1991). For instance, the energy level for an athlete's optimal performance in a basketball game is drastically different than a chess players energy level as they are optimally performing in a chess game (Jackson & Csikszentmihalyi, 1991). Understanding the optimal arousal level for each individual will optimize the athlete's opportunity to experience the flow mindset and achieve performance excellence in their respective sport and performance (Jackson & Csikszentmihalyi, 1991).

Experienced athletes, who are in tune with their bodies, are able to recognize when their energy levels are at optimal levels and are able to adjust their energy levels accordingly to support their performance (Jackson & Csikszentmihalyi, 1991). For instance, they can use psych up breathing and/or positive imagery to elevate their energy level, if they are feeling sluggish or unmotivated (Jackson & Csikszentmihalyi, 1991; Burton & Raedeke, 2008). In contrast, they would use diaphragmatic breathing and instructional positive self-talk to lower their energy level, such as when they are feeling anxious and distracted (Jackson & Csikszentmihalyi, 1991; Burton & Raedeke, 2008).

The first step in establishing an athlete's IZOF is being able to recognize when their optimal energy levels are in their ideal performance (Jackson & Csikszentmihalyi, 1991). Athletes can develop an awareness of their optimal energy levels and their IZOF by applying the process of imagery and recalling their performance highlights (Jackson & Csikszentmihalyi, 1991; Burton & Raedeke, 2008). Applying the process of imagery, provides the athlete with the opportunity to reflect on their ideal performances and retrieve all of the associated sensory input, including their associated concentration, feelings, and thoughts that were present in that performance that can support the athlete in applying the appropriate strategies to recreate the same experiences in future performance to optimize their IZOF (Jackson & Csikszentmihalyi, 1991; Burton & Raedeke, 2008; Williams & Krane, 2015).

For example, if the athlete was confident, relaxed, and operating with a narrow-external focus in their IZOF in their performance, the athlete can apply the following techniques in a pre-performance routine to achieve their IZOF (Williams & Krane, 2015). They can use a relaxation technique such as diaphragmatic breathing to establish their optimal arousal level, allowing them to achieve their ideal relaxation, optimize their concentration, as well as effectively apply positive self-talk and positive imagery to recreate that experience and establish the same level of confidence from that performance, followed by applying instructional positive self-talk (e.g., focus on the ball) and a narrow-external drill, such as their coach or teammate tossing different colored tennis balls at them and calling out the color to be hit at the last minute to enhance their narrow-external focus (Burton & Raedeke, 2008; Williams & Krane, 2015).

Athletes can also optimize their IZOF by effectively controlling their breathing (Spencer, n.d.). Athletes can provide themselves an additional eight hours of relaxation each day by applying diaphragmatic breathing every day, diminishing anxiety, improving focus and

effectiveness, and, in turn, increasing confidence (Spencer, n.d.). Diaphragmatic breathing provides athletes with many benefits, including increasing the amount of oxygen in their blood stream, resulting in an athlete experiencing more energy and effective performance (Spencer, n.d.). Athletes can optimize diaphragmatic breathing easily, by getting into the habit of taking five deep diaphragmatic breaths at specific times each day, such as before each meal, as this is an easy time to remember and is frequent enough for the athlete to experience the benefits of diaphragmatic breathing (Spencer, n.d.). Applying diaphragmatic consistently each day will help make it a habit for the athlete to experience the benefits and optimize their IZOF to support their performance (Spencer, n.d.).

Mindfulness is another effective strategy to help athletes to achieve their IZOF (Mindfulness, n.d.). Mindfulness is the present moment, nonjudgmental, objective awareness of an experience (Mindfulness, n.d.). Mindfulness is the ability to view thoughts and feelings, as transient phenomena that pass through us (Cotterill, et al., 2017). “A state of psychological freedom that occurs when attention remains quiet and limber, without attachment to any particular point of view. Research shows only positive outcomes from mindfulness” (Mindfulness & Breath, n.d.). Mindfulness practices can support athletes in acclimating to potential sources of distractions (e.g., thoughts, worries), by simply observing them and not letting them disrupt their experience (Mindfulness, n.d.; Cotterill, et al., 2017).

Mindfulness operates with the understanding that thinking is a habit and that with mindfulness individuals can have the agency in which thoughts that they entertain (Mindfulness & Breath, n.d.). Mindfulness is also the practice of systematically applying the appropriate tools and skills to bring the athlete back to the present moment (e.g., taking diaphragmatic breaths, focusing on their breath) (Mindfulness & Breath, n.d.). Mindfulness helps athletes to master their

craft by mastering their inner self and being present to enjoy the experience throughout the process (Caroll & Gervais, 2016). Mindfulness asks that "the athlete is in the here and now in everything that they do" (Caroll & Gervais, 2016). Mindfulness can be broken down in three segments, Awareness (e.g., be aware an experience is happening); Acceptance (e.g., accept that this is happening without resistance); and Action (e.g., observe experiences objectively and take action to support the most constructive experience) (Mindfulness & Breath, n.d.).

Athletes can enhance their awareness by observing their breath, followed by the sensations of their body, and then the thoughts that move through them (Mindfulness & Breath, n.d.). Athletes can enhance acceptance by agreeing and breathing into their experience and using positive self-talk to switch their thoughts to constructive thoughts (Mindfulness & Breath, n.d.). Athletes can enhance their action by asking themselves, "what would be helpful?" to take the most supportive action (Mindfulness & Breath, n.d.). Athletes can also use breath control to enhance their mindfulness and optimize their IZOF, as breath control reduces negative self-talk because the athlete's attention is focused on their breath and the numbers as they count their breath, leaving minimal room for unproductive, negative thinking (Mindfulness & Breath, n.d.).

When athletes effectively apply mindfulness practices, they are able to: maintain a high situational awareness, remain emotionally self-regulated, and establish high performance goals, as they have a mindful attention and are thus able to maintain a present-moment, nonjudgmental, objective awareness of their experiences, which acclimates them to potential distractions and allows them to remain process-oriented on task-relevant stimuli (Mindfulness, n.d.; Cotterill, et al., 2017). In contrast, athletes who do not effectively apply mindfulness practices experience working memory failures, impulsive and reactive behavior and their performance suffers, as they

are susceptible to internal pre-occupation and perceptual de-coupling, as they are unable to maintain an objective perception of their experiences (Mindfulness, n.d.).

Mindfulness supports mental resilience and helps athletes to maintain a healthy functioning, as it is not a shutting down of negative thoughts, it is an objective, present moment focus that allows athletes to observe their experiences and focus on task-relevant stimuli that support performance (Mindfulness, n.d.). In order for athletes to optimize mindfulness, athletes need to practice consistently (Mindfulness, n.d.). Mindfulness practices take four to eight weeks of practice twelve-minutes per day to establish a consistent application to benefit most from mindfulness (Mindfulness, n.d.). Athletes can benefit from applying the following steps: Step 1: find a comfortable seated position and focus on their breath; step 2: Select a specific region of the body to their direct their focus, such as the feelings of their abdomen as they inhale and exhale; step 3: Focus on that region and maintain it for five minutes; step 4: observe if the mind wanders, notice the content of the thoughts, and then gently refocus on their breath (Mindfulness, n.d.).

Mindfulness has the following benefits, including reducing stress; improving relationships and moods; transforming rumination or worrying to creative problem solving; distractions become a new form of insight and awareness; and outcomes become experiences that enhance the athlete's performance regardless of the outcome (e.g., catastrophic or positive) (Mindfulness, n.d.). Athletes can use their mindfulness practices to shift their focus to task-relevant stimuli and mitigate negative experiences, enhancing their performance and optimizing their IZOF (Mindfulness, n.d.).

In addition to mindfulness, athletes can also use the exercise called "the signal lights on the highway of performance" (SLHP) (SLHP, n.d.). The SLHP prepares the athlete mentally for

handling the performance pressures in the competition environment (SLHP, n.d.). The steps in SLHP include, establishing optimal relaxation such as through the process of diaphragmatic breathing, which releases both physical and mental tension; clearing the mind of any unproductive thoughts by finding a focal point; applying positive self-talk to keep their thoughts positive and direct their focus on task-relevant stimuli; and using the colors of a traffic light to optimize their self-awareness to support their performance (SLHP, n.d.).

Athletes can use the traffic light to illustrate the content of their thoughts (SLHP, n.d.). For instance, if the athlete is feeling confident, focused and performing optimally, their experience is a green light, such that everything is great, they are in their IZOF (i.e., keep performing) (SLHP, n.d.). If the athlete is starting to make a couple errors and they recognize that they are becoming distracted, their experience is a yellow light, such that the athlete should take "caution" and regain balance in their performance, such as taking a deep diaphragmatic breath and using positive self-talk to refocus on their performance (SLHP, n.d.).

Further, if the athlete, starts to have a racing mind, such that they start choking in performance and their performance is suffering, they may have missed their yellow light to refocus and they need to stop (i.e., let go of their current state of mind through diaphragmatic breathing, breath control, and positive self-talk, such as incorporating a recovery routine), to regain control and refocus to get back to the green light and their IZOF, where they can experience the flow mindset and achieve performance excellence (SLHP, n.d.; Burton & Raedeke, 2008; Williams & Krane, 2015). By developing an awareness of the athlete's traffic lights, they can effectively develop routines to support them prior to and in-performance to support them in achieving their IZOF, the flow mindset and performance excellence (SLHP, n.d.; Williams & Krane, 2015).

Understanding the significant relationship between arousal and performance can optimize an athlete's ability to establish the appropriate techniques to support them in achieving their IZOF (Williams & Krane, 2015; Weinberg & Gould, 2015; Burton & Raedeke, 2008). Mental Skills Training, mindfulness practices, and innovative techniques such as left-hand contractions optimize an athlete's ability to achieve their IZOF, the flow mindset, and performance excellence, as well as mitigate the phenomenon of choking (Weinberg & Gould, 2015; Williams & Krane, 2015; Beckmann, et al., 2013; Mesagno, et al., 2008; Mesagno & Mullane-Grant, 2010; Cross-Villasana, et al., 2015).

Worksheet (Front)

Use the process of imagery and think of a time where you had a best performance to help you to identify your individual zone of optimal functioning (IZOF) and optimal arousal level:

1) What did you do before your performance?_____

   _____

   _____.

2) What did you do during your performance? _____

   _____

   _____.

3) What were your thoughts?_____

   _____

   _____.

4) What emotions did you experience? _____

   _____

   _____.

5) How was your arousal level? Did you feel energized or relaxed? _____

   _____

   _____.

6) How was your concentration? Where was your focus? _____

   _____

   _____.

7) Now on the back of this worksheet we are going to put together techniques to help you to recreate your individual zone of optimal functioning.

Worksheet (Back)

1) Techniques to incorporate in your pre-performance routine to establish your IZOF:
    - _____
      _____.
    - _____
      _____.
    - _____
      _____.
    - _____
      _____.
2) Techniques to incorporate for a recovery routine to maintain your IZOF and optimal arousal levels:
    - _____
      _____.
    - _____
      _____.
    - _____
      _____.
3) Techniques to incorporate as a post-performance routine to reinforce your IZOF and optimal arousal levels to support your performance going forward:

- _____
_____
_____.

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